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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/914,198	11/13/2001	Tsuyoshi Sano	U013609-7	9580

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EXAMINER

SHOSHO, CALLIE E

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 02/06/2003 7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/914,198

Applicant(s)

SANO ET AL.

Examiner

Callie E. Shosho

Art Unit

1714

-- Th MAILING DATE of this communication appears on the cover sheet with the corresponding address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 22-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(a) Claim 22 recites that the ink set is used to form images on “special” ink jet recording paper. The scope of the claim is confusing because it is not clear what is meant by “special”.

(b) Claim 23 recites “ink composition of any of the ink sets of cited in claim 1”. The scope of the claim is confusing because it is not clear what is meant by “any of the ink sets” given that claim 1 only recites one ink set, i.e. comprising light ink and dark ink. Should the above phrase be re-written as “ink composition of the ink set cited in claim 1”?

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an

international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-2, 4, and 23-25 are rejected under 35 U.S.C. 102(e) as being anticipated by Takemoto et al. (U.S. 6,075,069).

Takemoto et al. disclose ink set comprising inks used in ink jet printing to make a recording wherein the ink set comprises yellow, light magenta, magenta, light cyan, cyan, and black inks (col.1, lines 6-8, cols. 12-13, and Table 3).

From cols.12-13 and Table 3, it can be seen that the ratio of dispersant to pigment for magenta ink 3 is 0.33 (1/3) while the ratio of dispersant to pigment for the light magenta ink 1 is 0.6 (0.3/0.5). Additionally, the ratio of the ratio of dispersant to pigment for the cyan ink 3 is 0.5 (1/2) while the ratio of dispersant to pigment for the light cyan ink 1 is 0.67 (0.2/0.3). Thus, it can be seen that the ratio of dispersant to pigment for the dark ink is lower than the same ratio for the light ink and that the amount of dispersant in the dark ink is greater than the amount of dispersant in the light ink.

In light of the above, it is clear that Takemoto et al. anticipate the present claims.

5. Claims 5, 7-10, and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Adkins et al. (U.S. 6,379,444).

Adkins et al. disclose an ink set comprising yellow, magenta, cyan, black, light magenta, and light cyan inks wherein the inks each comprise vehicle, 4-8% binder, and 1-25% pigment (col.4, lines 59-63, col.7, lines 15-20, col.7, line 65-col.8, line 2, col.8, lines 13-14, 32, and 65-67, and col.9, lines 1-18). Col.8, lines 13-15 disclose that the particle size of the ink is less than

200 nm so it is clear that the particle size of the polymer, i.e. binder, present in the ink is also less than 200 nm.

From Table 3, it is calculated that the magenta ink comprises 6.73% pigment (0.3×22.44) and 0.54% polymer (0.2×2.69), the cyan ink comprises 2.04% pigment (0.25×8.16) and 3.73% ($0.2 \times 8.47 + 0.15 \times 13.65$) polymer, the light magenta ink comprises 1.5% pigment and 3.71% percent polymer, and the light cyan ink comprises 0.42% pigment and 4.36% polymer. From these values, it is calculated that the ratio of dispersant to pigment for the magenta ink is 0.08, for the cyan ink is 1.82, for the light magenta ink is 2.48, and for the light cyan ink is 10.38.

Thus, it can be seen that the ratio of polymer to pigment for the dark ink is lower than the same ratio for the light ink and that the amount of polymer in the dark ink is less than the amount of polymer in the light ink.

In light of the above, it is clear that Adkins et al. anticipate the present claims.

6. Claims 1, 3, and 23-25 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 879857.

EP 879587 disclose ink set comprising inks used in ink jet printing to make a recording wherein the ink set comprises one black ink which has ratio of dispersant to polymer of 1.5 (15/10) and one black ink which has ratio of dispersant to pigment of 0.15 (2/15) (page 2, lines 7-12) and example 2).

Thus, it can be seen that the ratio of dispersant to pigment for the "dark" ink is less than the same ratio for the "light" ink and that the amount of dispersant in the dark ink is less than the amount of dispersant in the light ink.

In light of the above, it is clear that EP 879587 anticipate the present claims.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 5-6, 8-16, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takemoto et al. (U.S. 6,075,069) in view of Sano et al. (U.S. 5,503,664).

Takemoto et al. disclose ink set comprising inks used in ink jet printing to make a recording wherein the ink set comprises yellow, light magenta, magenta, light cyan, cyan, and black inks. The inks are made from pigments which include Pigment Red 122, Pigment Blue 15:3, Pigment Yellow 74, and carbon black (col.1, lines 6-8, cols. 12-13, and Table 3).

From cols.12-13 and Table 3, it can be seen that the ratio of dispersant to pigment for magenta ink 3 is 0.33 (1/3) while the ratio of dispersant to pigment for the light magenta ink 1 is 0.6 (0.3/0.5). Additionally, the ratio of the ratio of dispersant to pigment for the cyan ink 3 is 0.5 (1/2) while the ratio of dispersant to pigment for the light cyan ink 1 is 0.67 (0.2/0.3). Thus, it can be seen that the ratio of dispersant to pigment for the dark ink is lower than the same ratio for the light ink and that the amount of dispersant in the dark ink is greater than the amount of dispersant in the light ink.

The difference between Takemoto et al. and the present claimed invention is the requirement in the claims of the fine polymer particle.

Takemoto et al. disclose ink set comprising light ink and dark ink wherein each ink comprises a dispersant.

Sano et al., which is drawn to ink jet inks, disclose that a resin emulsion acts as a dispersant and that the resin emulsion can be used instead of a dispersant. The resin emulsion

has, for instance, minimum film-forming temperature of 5 °C and is used in the amount of 0.1-40% (col.4, lines 6-11, col.5, lines 12-14, col.6, lines 31-33, and col.7, line 31).

In light of the disclosure of Sano et al., it therefore would have been obvious to one of ordinary skill in the art to use fine polymer particle, i.e. resin emulsion, in place of the dispersant of Takemoto et al., and thereby arrive at the claimed invention.

10. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takemoto et al. in view of Sano et al. as applied to claims 5-6, 8-16, and 19 above, and further in view of Miyabayashi et al. (U.S. 6,271,285).

The difference between Takemoto et al. in view of Sano et al. and the present claimed invention is the requirement in the claims of the glass transition temperature of the fine polymer particles.

Miyabayashi et al., which is drawn to ink jet inks, disclose the use of fine polymer particles which have glass transition temperature less than 30 °C in order to produce ink which is strongly fixed to the recording medium and has excellent rub/scratch resistance and waterfastness (col.2, lines 31-33 and col.4, lines 41-43).

In light of the motivation for using fine polymer particle with specific glass transition temperature disclosed by Miyabayashi et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such polymer in the ink of Takemoto et al. in order to produce ink with excellent rub/scratch resistance and waterfastness, and thereby arrive at the claimed invention.

11. Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takemoto et al. in view of Sano et al. as applied to claims 5-6, 8-16, and 19 above, and further in view of Ono et al. (U.S. 6,299,675).

The difference between Takemoto et al. in view of Sano et al. and the present claimed invention is the requirement in the claims of the viscosity and the surface tension of the ink.

Ono et al., which is drawn ink jet ink set, disclose the use of ink which have surface tension of 30-68 dyne/cm and viscosity less than 15 cP in order to produce inks with good waterfastness (col.15, lines 28-35).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use inks with such surface tension and viscosity in the ink set of Takemoto et al. in order to produce inks with excellent waterfastness, and thereby arrive at the claimed invention.

12. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takemoto et al. in view of Sano et al. as applied to claims 5-6, 8-16, and 19 above, and further in view of Ohtsuka et al. (U.S. 6,260,938).

The difference between Takemoto et al. in view of Sano et al. and the present claimed invention is the requirement in the claims of printing ink set on special paper.

Ohtsuka et al., which is drawn to ink jet ink set, disclose that when using thin or light inks, a large amount of ink must be ejected onto the printing medium in order to produce an image with suitable color density. Ohtsuka et al. further disclose that plain paper has low ink absorbing capacity while special paper has high ink absorbing capacity (col.2, lines 32-52, col.3, lines 21-31, and col.12, lines 42-52).

Thus, given that large amounts of ink must be used with light inks and that only special paper can absorb such inks, it therefore would have been obvious to one of ordinary skill in the art to use special paper when printing the ink set of Takemoto et al., which contains light ink, so that the paper is able to effectively absorb the ink, and thereby arrive at the claimed invention.

13. Claims 14-18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adkins et al. (U.S. 6,113,679) in view of Miyabayashi et al. (U.S. 6,271,285).

Adkins et al. disclose an ink set comprising yellow, magenta, cyan, black, light magenta, and light cyan inks wherein the inks each comprise vehicle, 4-8% binder, and 1-25% pigment (col.4, lines 59-63, col.7, lines 15-20, col.7, line 65-col.8, line 2, col.8, lines 13-14, 32, and 65-67, and col.9, lines 1-18). Col.8, lines 13-15 disclose that the particle size of the ink is less than 200 nm so it is clear that the particle size of the polymer, i.e. binder, present in the ink is also less than 200 nm.

From Table 3, it is calculated that the magenta ink comprises 6.73% pigment (0.3×22.44) and 0.54% polymer, the cyan ink comprises 2.04% pigment (0.25×8.16) and 3.73% ($0.2 \times 8.47 + 0.15 \times 13.65$) polymer, the light magenta ink comprises 1.5% pigment and 3.71% percent polymer, and the light cyan ink comprises 0.42% pigment and 4.36% polymer. From these values, it is calculated that the ratio of dispersant to pigment for the magenta ink is 0.08, for the cyan ink is 1.82, for the light magenta ink is 2.48, and for the light cyan ink is 10.38.

The difference between Adkins et al. and the present claimed invention is the requirement in the claims of resin emulsion.

Adkins et al. disclose the use of fine polymer particle as binder, however, there is no disclosure of polymer emulsion as presently claimed.

Miyabayashi et al., which is drawn to ink jet inks, disclose the use of resin emulsion which functions as binder. The resin emulsion which contains fine polymer particles possesses particle size of 0.005-0.2 μm , minimum film forming temperature less than 30 $^{\circ}\text{C}$, glass transition temperature less than 30 $^{\circ}\text{C}$, and used in the ink in the amount of 1-10% (col.3, lines 5, 14-16, and 66-67, col.4, lines 26-43, and col.6, lines 59-67).

In light of the disclosure of Miyabayashi et al. of resin emulsion suitable for use as binder in ink jet ink, it therefore would have been obvious to one of ordinary skill in the art to use such resin emulsion as the binder in Adkins et al., and thereby arrive at the claimed invention.

14. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Adkins et al. in view of Miyabayashi et al. as applied to claims 14-18 and 20 above, and further in view of Kanaya (U.S. 5,985,015).

The difference between Adkins et al. in view of Miyabayashi et al. and the present claimed invention is the requirement in the claims of surface tension of the inks.

Kanaya, which is drawn to ink jet inks, disclose using inks possessing surface tension of 20-35 mN/m which is preferred in terms of stable ejection, suitable spreading of dots, and circularity of dots (col.7, lines 6-10).

In light of the motivation for using ink jet ink with specific surface tension disclosed by Kanaya et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use ink with such surface tension in Adkins et al. in order to produce ink which forms

circular dots and is stably ejected from the ink jet printer, and thereby arrive at the claimed invention.

15. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Adkins et al. in view of Miyabayashi et al. as applied to claims 14-18 and 20 above, and further in view of Ohtsuka et al. (U.S. 6,260,938).

The difference between Adkins et al. in view of Miyabayashi et al. and the present claimed invention is the requirement in the claims of printing ink set on special paper.

Ohtsuka et al., which is drawn to ink jet ink set, disclose that when using thin or light inks, a large amount of ink must be ejected onto the printing medium in order to produce an image with suitable color density. Ohtsuka et al. further disclose that plain paper has low ink absorbing capacity while special paper has high ink absorbing capacity (col.2, lines 32-52, col.3, lines 21-31, and col.12, lines 42-52).

Thus, given that large amounts of ink must be used with light inks and that only special paper can absorb such inks, it therefore would have been obvious to one of ordinary skill in the art to use special paper when printing the ink set of Adkins et al., which contains light ink, so that the paper is able to effectively absorb the ink, and thereby arrive at the claimed invention.

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Watanabe et al. (U.S. 6,491,748) disclose ink set comprising light and dark inks, however, each ink comprises the same amount of dispersant.

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17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 703-305-0208. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 703-306-2777. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Callie E. Shosho
Examiner
Art Unit 1714

CS
January 30, 2003